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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/804,389	03/13/2001	Jun-Lin Tsai	TS1998083B	6374

28112 7590 07/08/2003

GEORGE O. SAILE & ASSOCIATES
28 DAVIS AVENUE
POUGHKEEPSIE, NY 12603

EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/804,389

Applicant(s)

TSAI ET AL.

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12-20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bulucea et al., hereinafter Bulucea (U.S. 5,548,158) in view of Ernick et al., hereinafter Ernick (U.S. 3,648,123).

Regarding claims 12 and 20, Bulucea discloses, figures 5 and 6, an N type silicon body 52 (see column 8, lines 45-49) having an upper surface and an N+ buried collector 56 located a first distance below the upper surface and have a thickness; a secondary and a primary base region, 66 and 64, respectively, wherein the primary base region extends a third distance from the surface, and the secondary base region extends a second distance from the surface, the primary base region is more heavily doped than the secondary base region; and an emitter region 58 wholly within the primary base.

Bulucea does not disclose boron is uniformly distributed in the secondary base.

Ernick discloses constant impurity in a base region results in improved characteristics such as faster switching speed, and permitting less storage time of carriers within the base region (see column 4, lines 39-44). Ernick also discloses boron is a desirable impurity because of low diffusion constant in silicon. Therefore, it would

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have been obvious to one of ordinary skill in the art at the time of the invention to use constant boron impurity in the base region of Bulucea's structure, since constant boron doping of a base region results in faster switching speed and boron will not be out-diffused from the base region during the subsequent epitaxial growth process.

Regarding claims 13-19, Bulucea, in view of Ernick, renders obvious the claimed invention, as discussed above, except for the specific values for the distance of above regions from the surface of the substrate, and the resistivity of the base region. It would have been obvious to one of ordinary skill in the art at the time of the invention to include these values, since applicant has not disclosed that the specific values solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with different values. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Response to Arguments

3. Applicants arguments filed on 5/5/03 have been fully considered but they are not persuasive.

Applicants argue that in the primary reference, Bulucea, primary base region 64 is not wholly within secondary base region 66 "since part of it makes direct contact with collector 76" (see applicants' response, page 3, the last paragraph). To support this statement, applicants point out that at least some parts of primary base region 64 directly contacts collector 76 (see column 10, lines 52-55 of the reference). While it is

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true that the primary base contact region 76, as can be seen in figure 5 region 64 is in fact within region 66, which also contacts region 76. Therefore, because some electrons injected from emitter 58 will pass through region 64 directly into collector 76 (as applicants point out), while might be true, does not negate the fact that region 64 is wholly within region 66. Merriam-Webster's dictionary defines "within" as "inside", which in turn is defined as "on the inner side of". This definition is consistent with examiner's interpretation of region 64 being wholly within region 66, since, although region 64 shares a boundary area with region 66, but it is still on the inner side of region 66.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
July 1, 2003



LONG PHAM
PRIMARY EXAMINER